

CLAIMS

What is claimed is:

1 1. A method for retiring instructions processed through various processing stages,
2 comprising the steps of:
3 processing an instruction capable of early retirement until the instruction
4 meets the criteria for early retirement;
5 indicating that the instruction has met the early-retirement criteria;
6 processing the instruction to a desirable stage at which, based on the
7 indication the instruction has met the early-retirement criteria, the
8 instruction is terminated out of order of a program running the
9 instruction; and
10 updating a state of a system processing the instruction to reflect that the
11 instruction has been terminated.

1 2. The method of claim 1 wherein the desirable stage includes an instruction queue.

1 3. The method of claim 1 wherein the step of indicating comprises the step of
2 generating a signal associated with the instruction.

1 4. The method of claim 3 further comprises the steps of:
2 sending the signal to an early-retirement unit; and
3 the early-retirement unit arranging for the instruction to be terminated.

- 1 5. The method of claim 1 wherein the various processing stages include one or more
2 of the following stages: fetching, issuing, sorting, executing, queuing, and retiring.
- 1 6. The method of claim 1 wherein the instruction capable of early retirement includes
2 an identification tag for identifying whether the instruction is capable of early
3 retirement.
- 1 7. The method of claim 1 wherein NO-OP instructions, pre-fetch instructions, branch
2 instructions, nullified instructions, and predicated-false instructions are identified
3 as instructions capable of early retirement.
- 1 8. The method of claim 1 wherein the criteria for early retirement are met when
2 continued processing the instruction does not change the architectural state of the
3 system processing the instruction.
- 1 9. The method of claim 1 wherein the criteria for early retirement are met when
2 continued processing the instruction does not change the behavior of the program
3 running the instruction.
- 1 10. A computer-readable medium embodying instructions that cause a computer to
2 perform a method for retiring instructions processed through various processing
3 stages, the method comprising the steps of:
4 processing an instruction capable of early retirement until the instruction
5 meets the criteria for early retirement;
6 indicating that the instruction has met the early-retirement criteria;

7 processing the instruction to a desirable stage at which, based on the
8 indication that the instruction has met the early-retirement criteria,
9 the instruction is terminated out of order of a program running the
10 instruction; and
11 updating a state of a system processing the instruction to reflect that the
12 instruction has been terminated.

1 11. The computer-readable medium of claim 10 wherein the desirable stage includes
2 an instruction queue.

1 12. The computer-readable medium of claim 10 wherein the step of indicating
2 comprises the step of generating a signal associated with the instruction.

1 13. The computer-readable medium of claim 12 wherein the method further comprises
2 the steps of:

3 sending the signal to an early-retirement unit; and

4 the early-retirement unit arranging for the instruction to be terminated.

1 14. The computer-readable medium of claim 10 wherein the various processing stages
2 include one or more of the following stages: fetching, issuing, sorting, executing,
3 queuing, and retiring.

1 15. The computer-readable medium of claim 10 wherein the instruction capable of
2 early retirement includes an identification tag for identifying whether the
3 instruction is capable of early retirement.

1 16. The computer-readable medium of claim 10 wherein NO-OP instructions, pre-
 2 fetch instructions, branch instructions, nullified instructions, and predicated-false
 3 instructions are identified as instructions capable of early retirement.

1 17. The computer-readable medium of claim 10 wherein the criteria for early
 2 retirement are met when continued processing the instruction does not change the
 3 architectural state of the system processing the instruction.

1 18. The computer-readable medium of claim 10 wherein the criteria for early
 2 retirement are met when continued processing the instruction does not change the
 3 behavior of the program running the instruction.

1 19. A system for retiring instructions processed through various processing stages,
 2 comprising:
 3 first processing means for processing an instruction capable of early
 4 retirement until the instruction meets the criteria for early
 5 retirement;
 6 indicating means for indicating that the instruction has met the early-
 7 retirement criteria;
 8 second processing means for processing the instruction to a desirable stage
 9 at which, based on the indication that the instruction has met the
 10 early-retirement criteria, the instruction is terminated out of order of
 11 a program running the instruction; and
 12 updating means for updating a state of the system to reflect that the
 13 instruction has been terminated.

- 1 20. The system of claim 19 wherein the desirable stage includes an instruction queue.

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